

DRY CLEANING PROCESS EMPLOYING A
UNITARY CHEMICAL DISPENSING CABINET

TECHNICAL FIELD

5 This invention relates to a process for dry cleaning fabrics. More particularly, it refers to the employment of a chemical dispensing cabinet with multiple dispensing tubes mounted on a front panel, each dispensing tube emitting selected chemicals to spot clean stains on garments in a dry cleaning process.

BACKGROUND ART

10 Dry cleaning of garments is a well known art in which, customarily, different dry cleaning solutions from separate tanks are employed as shown in U.S. Patent 774,025. Spot cleaning is known from U.S. Patent 3,320,780 where a plurality of pressure receptacles for spotting fluids are housed in a base section of a cabinet. A spray gun sprays spotting fluid onto stained portions of a fabric located on a base portion of the cabinet. Additional cleaning systems are set forth in U.S. Patents 5,234,268; 5,259,557 and 5,435,157. In view of air pollution regulations for the dry cleaning industry a need exists for a spot cleaning system that minimizes air pollution. Furthermore, since many dry cleaning facilities are frequently small in size, an easily mountable spot cleaning system that

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minimizes space requirements while still reducing air pollution is urgently needed.

SUMMARY OF THE INVENTION

5 The process of this invention provides a system minimizing escape of volatile organic dry cleaning solvents and provides a unitary chemical dispensing cabinet that includes the chemicals commonly used to remove different stains from garments. The process provides a cabinet with a front panel having depressions for mounting multiple chemical dispensing tubes. 10 Each tube is connected by a conduit to a base portion of a chemical containment housing mounted on a panel within the cabinet. In addition, a connecting line attached to a tension spool mounted within the interior of the cabinet is connected to the tube to retain it in the cabinet front panel depression. 15 Pulling the tube away from the cabinet and depressing a soft elastomeric middle portion of the tube causes fluid to flow from a flexible bag in the containment housing to a narrow opening at the tip of the tube which is pointed at the garment stain.

BRIEF DESCRIPTION OF THE DRAWINGS

20 The invention can be best understood by those having ordinary skill in the art by reference to the following detailed description when considered in conjunction with the

accompanying drawings in which:

FIG. 1 is a front prospective view of the chemical dispensing cabinet of this invention.

FIG. 2 is a bottom perspective view of the chemical dispensing cabinet with one chemical dispensing tube displayed for use.

FIG. 3 is a sectional view of the dispensing tube along line 3-3 of FIG. 2.

FIG. 4 is a sectional view of the dispensing tube along line 3-3 of FIG. 2, but with the tube squeezed to permit outward flow of a chemical agent.

FIG. 5 is a front view of the dispensing tube of FIG. 4.

FIG. 6 is a perspective view of the chemical dispensing cabinet opened.

FIG. 7 is an enlarged perspective view of the opened chemical dispensing cabinet with one chemical bag holder disengaged from its base portion and one wire reel box cut away.

FIG. 8 is a perspective view of the chemical bag containment housing opened.

FIG. 9 is a sectional view showing an open connection to the chemical bag to permit flow of chemicals.

FIG. 10 is a sectional view of the valve removed from its

chemical bag connection to cease flow of all chemicals.

FIG. 11 is a perspective view of a table mount frame for the chemical dispensing cabinet.

FIG. 12 is a perspective view of a floor mount frame for the chemical dispensing cabinet.

BEST MODE FOR CARRYING OUT THE INVENTION

Throughout the following detailed description the same reference numerals refer to the same elements in all figures.

Referring to FIGS. 1 and 2, the chemical dispensing cabinet 10 in this invention has multiple soft elastomeric dispensing tubes 12 with conduits 14 leading to the interior of the dispensing panel. Multiple holding indentations or depressions 16 on the front face 18 of the dispensing cabinet 10 retain the dispensing tubes 12 with the assistance of a wire connection 20. The dispensing tubes 12 retained under tension in slot 16 by the tension reel 57 in reel box 56. The chemical dispensing panel 10 has a top side 22, a left side 24 and a right side 26 with a bottom side 28. A back panel 30 is hinged 32 to the panel portions 18, 22, 24 and 28 integral with cabinet front frame 29.

The soft elastomeric dispensing tube 12 shown in cross section in FIGS. 3 and 4 has an elastomeric cylindrical housing 34 and a front nipple holder 36 retaining a conical nipple 38.

Housing 34 also overlays a rear tube mount 40. The conduit 14 is placed over a conical portion 41 of rear tube mount 40. A rear portion of spring 42 is retained within the rear tube mount 40 by opposed flanges 44 and 46. A front portion of spring 42 presses against a ball valve 50 closing an opening 48 within the cylindrical housing 34. When the cylindrical housing 34 is depressed as shown in FIGS. 4 and 5, the ball 50 moves away from channel 52 to allow the chemicals to flow into the conical nipple 38. On release of the cylindrical housing 34, the spring 42 acts to push the ball 50 back in place in front of channel 52 and prevents further flow of chemicals.

As shown in FIGS. 6 and 7, the interior 54 of the dispensing panel 10 has a wire reel box 56 containing a wind-up tension reel 57. The wire 20 wound on reel 57 leads to and is attached to dispensing tube 12 which is held under tension in depression 16. The back side 17 of depression 16 is seen in FIG. 6. Adjacent the wire reel boxes 56 is a panel 58 on which is mounted a base portion 60 for a containment housing 62. Rails 82 and 84 on the bottom of the containment housing 62 slide into slots 86 and 88, respectively on the base portion 60. The containment housing 62 as shown in FIG. 9, retains a plastic bag 64 containing the chemicals used for the dry cleaning process. A fixture 16 with opening 67 at the bottom

of each chemical bag 64 engages an upwardly extending nozzle 68 in the base portion 60. An outlet 70 at the base of nozzle 68 is attached to the conduit 14 leading to the dispensing tube 12. Pushing down on lever 90 lifts containment housing 62 off base portion 60 so that a new flexible chemical bag 64 can be inserted.

The chemicals contained in each bag 64 will be any one of the following compositions:

STAIN	CHEMICAL COMPOSITION
1. Grease or cosmetics.	100% trichloroethylene
2. Paint, oil, grease, tar, lipstick, crayon wax, varnish and inks.	25% amyl acetate 15% anionic surfactant 60% chlorinated solvent
3. Cuff and collar soil, latex paints and some inks.	25% anionic surfactant 25% nonionic surfactant 50% aliphatic solvent
4. Tannin stains including coffee, tea, beer, wine, grass, soft drinks, mustard and fruit juice.	15% nonionic surfactant 25% sodium N-methyleyl taurate 5% glycolic acid 5% polypropylene glycol 50% water
5. Protein stains such as blood, albumen, egg, milk and ice cream.	15% ammonia 10% nonionic surfactant 75% water
6. Oily stains from silk and rayon.	20% nonionic surfactant 80% aliphatic solvent
7. Paint, oil, grease, tar, lipstick, rayon, wax and varnishes.	25% anionic surfactant 75% dLimonene solvent

8. Rust.

10% hydrogen fluoride
30% ammonium bifluoride
60% water

Additional chemicals well known in the prior art also can be used in the flexible chemical bags 64 to remove stains from garments.

FIGS. 9 and 10 show the position of the fixture 66, its opening 67, valve 68, and the outlet 70 from the base portion 60 when chemicals are flowing, as shown in FIG. 9, and when the fixture 66 is closed in FIG. 10.

FIG. 11 shows the chemical dispensing panel 10 mounted on a table mount 72, and FIG. 12 shows the chemical dispensing panel 10 attached to a floor mount 74.

The chemical dispensing panel 10 can be made of a high strength plastic or lightweight metal and can have decorative portions 76, 78, and 80. The decorative portions can contain indicia. The containment housing 62 and the chemical containing bags 64 are made of a plastic as is the base portion 60.

Other equivalent elements can be substituted for the elements of the chemical dispensing cabinet which have been described in order to obtain substantially the same results in substantially the same way and with substantially the same function.